WHAT IS CLAIMED IS:

1. An imaging system for imaging a sample of interest comprising:

an emitter enabled to project imaging radiation through said sample of interest, at least one of said emitter and said sample of interest being manipulable such that relative movement between said imaging radiation and said sample of interest is enabled; and

a plurality of detecting modules disposed in a sparsely distributed configuration, including a first detecting module that is spaced apart from a neighboring second detecting module, said first and second detecting modules each having an array of sensors that are responsive to said imaging radiation, said detecting modules being cooperatively aligned with said emitter such that multiple said detecting modules are simultaneously irradiated by a continuous pattern of said imaging radiation, said detecting modules being cooperative with said emitter and said sample of interest for detecting regions of said sample of interest to generate series of sub-images during said relative movement between said imaging radiation and said sample of interest.

2. The imaging system of claim 1 wherein said first detecting module and said neighboring second detecting module are coupled to an integrating unit by respective first and second channels, said first channel being independent from said second channel, said integrating unit including processing circuitry for integrating said sub-images to form a composite image of said sample of interest.

3. The imaging system of claim 2 wherein said composite image includes one of a three-dimensional image and a two-dimensional slice of said three-dimensional image.

4. The imaging system of claim 1 wherein said detecting modules each include a substrate having a physically discrete array of sensors.

5. The imaging system of claim 1 wherein said emitter is disposed such that said imaging radiation is diffused from said emitter and is received by said multiple detecting modules at a projected angle.

6. The imaging system of claim 5 wherein at least one of said detecting modules is configured to detect a plurality of successive said sub-images during said relative movement, said successive sub-images including a first sub-image having overlapping characteristics with a second sub-image.

7. The imaging system of claim 6 further comprising an integrating unit coupled to said detecting modules for computationally combining said plurality of sub-images from said plurality of detecting modules to form a composite image.

8. The imaging system of claim 1 wherein said emitter is an x-ray tube for projecting x-ray radiation, said emitter and said detecting module being on opposite sides of said sample of interest.

9. An x-ray imager for generating an image of an object comprising:

an x-ray source for projecting a pulse of x-ray radiation through said object, said pulse being projected from a continuous region of said source; and

a plurality of discrete sensor arrays, each said sensor array including a substrate having a two-dimensional pattern of sensor elements, at least some of said sensor arrays being spaced apart from adjacent sensor arrays by a distance greater than one-quarter of a cross-sectional distance of said two-dimensional pattern while being sufficiently close to enable said pulse to simultaneously irradiate a plurality of said sensor arrays, said sensor arrays being arranged for detecting time series of sub-images of overlapping portions of said object, said sub-images in each said time series being distinguishable as a result of relative displacement of said object with respect to said x-ray radiation from said source.

10. The x-ray imager of claim 9 wherein said distance is greater than one-half of said cross-sectional distance of said two-dimensional pattern, said sensor arrays being substantially identical.

11. The x-ray imager of claim 9 wherein said distance is at least equal to said cross-sectional distance of said two-dimensional pattern, said sensor arrays being substantially identical.

12. The x-ray imager of claim 9 wherein said substrate is mounted on a detector support assembly, said detector support assembly including a supporting substrate on which said sensor arrays are individually mounted.

13. The x-ray imager of claim 9 further comprising a controller for sequencing said relative displacement to generate said time series of sub-images and an integrator for computationally combining said sub-images to form one of a three-dimensional image and a two-dimensional slice of said object.

14. The x-ray imager of claim 9 further comprising an assembly for providing said relative displacement such that manipulation of said object is in a first direction and manipulation of said x-ray radiation from said source is in a second direction, said first direction being substantially perpendicular to said second direction.

15. The x-ray imager of claim 9 further comprising an assembly for providing said relative displacement at uniform velocity.

16. The x-ray imager of claim 9 wherein said object is a printed circuit board (PCB).

17. A method of forming a composite image comprising the steps of:

projecting timed pulses of x-ray radiation from a common source through a sample of interest;

providing relative movement between projections of said x-ray radiation from said source and said sample of interest;

exposing a sparsely distributed configuration of area detectors to said pulses after passage through said sample of interest, such that spaced apart regions of said sample of interest are imaged for each of said pulses;

acquiring a plurality of sub-images corresponding to portions of said sample of interest during said relative movement by said area detectors; and

processing said sub-images to form an image of said sample of interest.

18. The method of claim 17 wherein said step of acquiring includes collecting a sequence of sub-images corresponding to overlapping regions of said sample of interest by at least one of said area detectors during said relative movement, said step of processing including integrating said sequence of sub-images to generate said image.

19. The method of claim 18 wherein said step of collecting includes projecting at least one pulse of said x-ray radiation onto said sample for each of said overlapping regions.

20. The method of claim 17 wherein said step of acquiring includes associating each of said sub-images with axial direction information and axial position information of a pulse that was used to form said sub-image.

21. The method of claim 17 wherein said step of processing said sub-images includes forming one of a three-dimensional image and a two-dimensional view of said three-dimensional image of said sample of interest.

22. The method of claim 17 wherein said step of exposing said plurality of area detectors includes providing dedicated electrical connection between each of said area detectors and common processing circuitry so as to enable electrical isolation among said area detectors.

23. The method of claim 18 wherein said step of integrating includes computationally combining said sequence of sub-images after at least one of:

a. scaling,

b. resampling to change magnification,

c. offsetting spatially to match regions, and

d. adjusting to reflect an absorption of said radiation by said sample of interest.

24. The method of claim 23 wherein said step of combining includes algebraically adding said sub-images of said sequence.

25. The method of claim 23 wherein said step of combining includes one of unfiltered backprojecting and filtered backprojecting.

26. The method of claim 23 wherein said step of combining includes selecting said sub-images having minimum artifacts.